SEQUENCE LISTING

<110>   Cahoon, Rebecca E.
        Falco, Saverio C.
        Kinney, Anthony J.
        Miao, Guo-Hua

<120>   Plant Polyphenol Oxidase Homologs

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Phe Pro Leu Ser Leu Pro Arg Thr Ser Ser Gly Phe Arg Pro Arg Arg
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Val Thr Val Gln Arg Val Ser Cys Ala Ser Pro Arg Gly Glu Arg Ser

1

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              35                      40                      45

  Glu Pro Asp Ala Gln Lys His Asp Arg Arg Asp Val Leu Leu Gly Leu
       50                  55                  60

  Gly Ala Leu Gly Ala Ser Ala Thr Ala Thr Leu Ala Ser Ala Arg Arg
   65                  70                  75                  80

  Ala Gly Ala Asp Pro Val Ala Thr Pro Asp Ile Ser Ser Cys Gly Gln
               85                  90                  95

  Ala Asn Leu Pro Val Ser Ala Asn Val Leu Thr Cys Cys Pro Pro Pro
              100                 105                 110

  Ser Ser Ala Leu Pro Val Asp Phe Ile Leu Pro Asp Ala Thr Ser Leu
              115                 120                 125

  Pro Leu Arg Thr Arg Pro Ala Ala His Ser Val Thr Thr Asp Tyr Val
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  Ala Lys Val Gln Arg Arg
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  gcgtctcgtg cgcatctccc agaggcgaac gctccgagcc agacgcccaa aagcacgacc  180
  gccgcgacgt cctcctcggc ctcggagcgc tcggtgccag tgccaccgct accctggcgt  240
  ccgcgcgccg cgccggcgcc gaccccgtcg ccacgcccga catctcttcc tgcggccaag  300
  cgaaccttcc ggtgagcgcc aacgtgctga cgtgctgccc gccgccctcg agcgcgctgc  360
  ccgtggactt catcctcccc gacgccacgt ccttgccgct ccggacgcgc cccgccgcgc  420
  actcggtcac cacggactac gtcgccaagt caacgccgg gatcgctgcg atgaaggcgc  480
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  acgggtcgta cagccccgag gggttccccg tgtgtggagct ccaggtgcac aactcgtggc  600
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  tcggcgaccc cggcttcgcg gtaccgttct ggaactggga cgcgccggac gggatgcgca  720
  tgccggccat gtacgcggac cggtcatccc agctgttcga tccgcggcgt gacagccggc  780
  acgcgccgcc gaagctcatc aatctggact acaacgccaa cgttagggag ccgaggttca  840
  cttactaaca acaggttgat cacaacctca gggtcatgta ccgtcaggta attaacaacg  900
  tgtgtttaca tgctatgaag tatgaactgc cgaaaccaag tacatggtct tggaatcttg  960
  ccaaaactga tcaaaaaaaa aaaaaaaaa aaaaa                              995

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  <213>   Zea mays

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              20                  25                  30

  Val Thr Val Gln Arg Val Ser Cys Ala Ser Pro Arg Gly Glu Arg Ser

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Glu Pro Asp Ala Gln Lys His Asp Arg Arg Asp Val Leu Leu Gly Leu
    50   55   60

Gly Ala Leu Gly Ala Ser Ala Thr Ala Thr Leu Ala Ser Ala Arg Arg
65   70   75   80

Ala Gly Ala Asp Pro Val Ala Thr Pro Asp Ile Ser Ser Cys Gly Gln
            85   90   95

Ala Asn Leu Pro Val Ser Ala Asn Val Leu Thr Cys Cys Pro Pro Pro
            100   105   110

Ser Ser Ala Leu Pro Val Asp Phe Ile Leu Pro Asp Ala Thr Ser Leu
        115   120   125

Pro Leu Arg Thr Arg Pro Ala Ala His Ser Val Thr Thr Asp Tyr Val
    130   135   140

Ala Lys Phe Asn Ala Gly Ile Ala Ala Met Lys Ala Leu Pro Ala Asp
145   150   155   160

Asp Pro Arg Ser Phe Ala Ala Gln Ala Ser Val His Cys Ala Tyr Cys
            165   170   175

Asp Gly Ser Tyr Ser Pro Glu Gly Phe Pro Gly Val Glu Leu Gln Val
            180   185   190

His Asn Ser Trp Leu Phe Phe Pro Phe His Arg Cys Tyr Leu Tyr Phe
        195   200   205

Phe Glu Arg Ile Leu Gly Ser Leu Ile Gly Asp Pro Gly Phe Ala Val
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Pro Phe Trp Asn Trp Asp Ala Pro Asp Gly Met Arg Met Pro Ala Met
225   230   235   240

Tyr Ala Asp Arg Ser Ser Gln Leu Phe Asp Pro Arg Arg Asp Ser Arg
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Glu Pro Arg Phe Thr Tyr
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ccaaggaggc cgggtctccg gcgcccaccg cgggcgcgct cccggcgaca ctgaaccaga 240
ccgtgcgggt ggccgtgacg cggcccaaga cctcgaggac ccgcaaggag aaggacgcca 300
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 1   5   10   15

Asp Ala Ser Phe Leu Phe Tyr Asp Glu Glu Ala Arg Leu Val Arg Val
            20   25   30

Arg Val Arg Asp Cys Leu Asp Thr Ala Ala Leu Gly Tyr Ala Tyr Gln
            35   40   45

Asp Val Ala Leu Pro Trp Leu Asn Ala Lys Pro Ala Lys Glu Ala Gly
        50   55   60

Ser Pro Ala Pro Thr Ala Gly Ala Leu Pro Ala Thr Leu Asn Gln Thr
 65   70   75   80

Val Arg Val Ala Val Thr Arg Pro Lys Thr Ser Arg Thr Arg Lys Glu
                85   90   95

4

Lys Asp Ala Lys Glu Glu Val Leu Val Val Gln Gly Ile Glu Ile Ala
            100   105   110

Asp His Ser Asn Xaa Phe Val Xaa Phe Asp Leu Phe Val Asn
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cgtgtctgca gtgtataatg ttccttccaa gtctaccact ctcccttctt ccctgcatcc 180
attttcacaa tcccaatcca ctaaatatag aaaatcaaaa caccatcaca ctcctagagt 240
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            20   25   30

Lys Ser Lys His His His Thr Pro Arg Val Thr Cys Asn Ser Gly Asn
            35   40   45

Gln Asn Lys Gly Glu Lys Pro Asp Ile His Ile Glu Gln Arg Arg Asn
    50   55   60

Ile Leu Leu Gly Leu Gly Gly Leu Cys Gly Ala Ala Thr Leu Asn Asn
 65   70   75   80

Asn Pro Phe Ala Phe Ala Ala Pro Ile Ser Pro Pro Arg Pro Asn Thr
                85   90   95

Cys Gly Pro Pro Asp Leu Pro Glu Gly Ala Glu Pro Thr Asn Cys Cys
            100   105   110

Pro Pro Phe Ser Ser Thr Ile Ile Asp Phe Lys Phe Pro Pro Ser Asn
            115   120   125

Lys Pro Leu Arg Val Arg Pro Ala Ala His Leu Val Asp Lys Asn Tyr
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Leu Ala Lys Tyr Lys Lys Ala Ile Xaa Leu Met Lys
145   150   155

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tgcatccatt ttcacaatcc caatccacta aatatagaaa atcaaaacac catcacactc   240
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aacaaaggag gaacattcta cttggcctag gagggctttg tggtgctgct actcttaaca   360
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gaggcatcaa gatagatctt gttgcagatt aaaaaatatt tatatacttc gactgtttaa 1920
cctcataata atatatatat atatatatat aatgtagttt cttggatttg tgtttgcttt 1980

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aaaaaaaacc cccgggggggg ggccgggaac aaaatccccc aaaaagagag tcataaaacg 2160
cgcgcacagg ggccgtcttt taaaaacctc gaaagggaaa aaacccgggc gaaacaaaat 2220
aaaaacccctt taaaaaaaac cccccttttcc aaaagggggaa aaaaaaaaaa aaggcccaca 2280
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ggcaaaaaaa ccgggggggg tgtgggggat acccaaatgt aaccgaaaaa tttgaaaacc 2400
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                20                  25                  30

His Pro Phe Ser Gln Ser Gln Ser Thr Lys Tyr Arg Lys Ser Lys His
            35                  40                  45

His His Thr Pro Arg Val Thr Cys Asn Ser Gly Asn Gln Asn Lys Gly
        50                  55                  60

Glu Lys Pro Asp Ile His Ile Glu Gln Arg Arg Asn Ile Leu Leu Gly
65                  70                  75                  80

Leu Gly Gly Leu Cys Gly Ala Ala Thr Leu Asn Asn Asn Pro Phe Ala
                85                  90                  95

Phe Ala Ala Pro Ile Ser Pro Pro Asp Leu Thr Thr Cys Gly Pro Pro
                100                 105                 110

Asp Leu Pro Glu Gly Ala Glu Pro Thr Asn Cys Cys Pro Pro Phe Ser
            115                 120                 125

Ser Thr Ile Ile Asp Phe Lys Phe Pro Pro Ser Asn Lys Pro Leu Arg
        130                 135                 140

Val Arg Pro Ala Ala His Leu Val Asp Lys Asn Tyr Leu Ala Lys Tyr
145                 150                 155                 160

Lys Lys Ala Ile Asp Leu Met Lys Lys Leu Pro Ala Asn Asp Pro Arg
                165                 170                 175

Asn Phe Met Gln Gln Ala Asn Val His Cys Ala Tyr Cys Thr Gly Ser
                180                 185                 190

Tyr Asp Gln Val Gly Phe Pro Gly Leu Glu Leu Gln Val His Ser Ser
            195                 200                 205

Trp Leu Phe Phe Pro Tyr His Arg Trp Phe Leu Tyr Phe Tyr Glu Arg
        210                 215                 220

Ile Leu Gly Ser Leu Ile Asn Asp Pro Thr Phe Ala Leu Pro Phe Trp
225                 230                 235                 240
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7

Asn Trp Asp Ala Pro Lys Gly Met Gln Leu Pro Ser Ile Tyr Ala Asp
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Pro Lys Ser Pro Leu Tyr Asp Pro Leu Arg Asn Ala Asn His Gln Pro
            260   265   270

Pro Thr Leu Val Asp Phe Asp Phe Asn Leu Asp Asn Pro Ile Ser Asn
            275   280   285

Gly Arg Ile Ser Thr Asn Leu Thr Ile Met Tyr Arg Gln Leu Val Ser
    290   295   300

Asn Gly Lys Thr Pro Thr Leu Phe Leu Gly Asn Pro Tyr Arg Ala Gly
305   310   315   320

Asp Ala Pro Asp Pro Gly Gly Gly Ser Val Glu Gly Val Pro His Gly
            325   330   335

Pro Val His Leu Trp Thr Gly Asp Ile Asn Gln Pro Asn Ile Glu Asn
            340   345   350

Met Gly Asp Phe Tyr Ser Ala Ala Arg Asp Pro Ile Phe Tyr Ser His
            355   360   365

His Ser Asn Val Asp Arg Met Trp Ser Ile Trp Lys Thr Leu Gly Gly
    370   375   380

Lys Arg Arg Asp Phe Thr Asp Ser Asp Trp Leu Glu Ser Gly Leu Leu
385   390   395   400

Phe Tyr Asp Glu Asn Lys Asn Leu Val Arg Val Lys Val Lys Asp Cys
            405   410   415

Leu Asp Thr Arg Lys Leu Gly Tyr Val Tyr Gln Asp Val Glu Ile Pro
            420   425   430

Trp Leu Lys Ser Lys Pro Ser Pro Arg Arg Ser Arg Val Gln Lys Val
    435   440   445

Ala Leu Gly Pro His Phe Asn Thr Gly Val Ala Arg Ala Ala Glu Thr
    450   455   460

Ser Arg Asn Val Gln Phe Pro Leu Val Leu Asp Ser Val Val Ser Ile
465   470   475   480

Val Val Lys Arg Pro Lys Lys Ser Arg Ser Lys Lys Glu Lys Glu Glu
            485   490   495

Glu Glu Glu Val Leu Val Ile Glu Gly Val Glu Tyr Asp Ser Asn Ile
            500   505   510

Pro Val Lys Phe Asp Val Leu Ile Asn Asp Glu Asp Asp Lys Gln Ile
            515   520   525

Gln Pro Glu Asp Ser Glu Tyr Ala Gly Ser Phe Val Thr Val Pro His
    530   535   540

Ser His Lys His Lys Asn Lys Lys Ile Ile Thr Cys Leu Arg Leu Gly
545   550   555   560

8

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Leu Thr Asp Leu Leu Glu Glu Leu Glu Ala Glu Asp Asp Asp Ser Val
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Val Val Thr Leu Val Pro Arg Tyr Gly Lys Gly Arg Val Gln Ile Gly
                580                    585                590

Gly Ile Lys Ile Asp Leu Val Ala Asp
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                20   25   30

Cys Lys Ala Thr Gly Gly Arg Val Asp Arg Arg Asp Val Leu Leu Gly
            35   40   45

Leu Gly Ser Ala Ala Ala Ala Gly Leu Gly Ala Gln Arg Gly Arg Gly
        50   55   60

Ala Ile Ala Ala Pro Ile Gln Ala Pro Asp Leu Gly Asn Cys Asn Pro
 65   70   75   80

Pro Asp Leu Pro Asn Thr Ala Pro Asp Thr Asn Cys Cys Pro Thr Ser
                85   90   95

Gly Thr Gly Ile Ile Asp Phe Val Leu Pro Pro Ala Pro Arg Ala Pro
            100   105   110

Leu Arg Val Arg Pro Ala Ala His Leu Ala Asp Ala Glu Tyr Leu Ala
        115   120   125

Lys Tyr Glu Arg Ala Val Ala Leu Met Lys Gln Leu Pro Ala Asp Asp
    130   135   140

Pro Arg Ser Ser Lys Gln Gln Trp Arg Val His Cys Ala Tyr Cys Glu
145   150   155   160

Arg Pro Xaa Arg Gln Val
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actggcttga caccgccttc ctcttctacg acgaggaggc cgccccgtg cgcgtccgcg 1200

10

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<213>   Triticum aestivum

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Cys Lys Ala Thr Gly Gly Arg Val Asp Arg Arg Asp Val Leu Leu Gly
            35                  40                  45


Leu Gly Ser Ala Ala Ala Ala Gly Leu Gly Ala Gln Arg Ala Arg Gly
         50                  55                  60


Ala Ile Ala Ala Pro Ile Gln Ala Pro Asp Leu Gly Asn Cys Asn Pro
 65                  70                  75                  80


Pro Asp Leu Pro Asn Thr Ala Pro Asp Thr Asn Cys Cys Pro Thr Ser
               85                  90                  95


Gly Thr Gly Ile Ile Asp Phe Val Leu Pro Pro Ala Ser Ser Ala Pro
              100                 105                 110


Leu Arg Val Arg Pro Ala Ala His Leu Ala Asp Ala Glu Tyr Leu Ala
             115                 120                 125


Lys Tyr Glu Arg Ala Val Ala Leu Met Lys Gln Leu Pro Ala Asp Asp
             130                 135                 140


Pro Arg Ser Phe Glu Gln Gln Trp Arg Val His Cys Ala Tyr Cys Asp
145                 150                 155                 160


Gly Ala Tyr Asp Gln Val Gly Phe Pro Asp Leu Glu Ile Gln Val His
                 165                 170                 175


Asn Cys Trp Leu Phe Phe Pro Trp His Arg Phe Tyr Leu Tyr Phe His
             180                 185                 190


Glu Arg Ile Leu Gly Lys Leu Ile Gly Asp Asp Thr Phe Ala Leu Pro
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11

Phe Trp Asn Trp Asp Ala Pro Asp Gly Met Thr Leu Pro Ala Ile Tyr
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Ala Asn Arg Ser Ser Pro Leu Tyr Asn Glu Arg Arg Asn Pro Ala His
225   230   235   240

Gln Pro Pro Phe Pro Val Asp Leu Asp Phe Asn Glu Ile Asp Val Ile
                245   250   255

Ile Pro Thr Asp Glu Gln Ile Asp Gln Asn Leu Asn Ile Met Tyr Arg
            260   265   270

Gln Met Val Ser Gly Ala Lys Lys Thr Arg Leu Phe Met Gly Gln Pro
        275   280   285

Tyr Arg Ala Gly Asp Gln Pro Asp Pro Gly Ala Gly Ser Val Glu Asn
    290   295   300

Val Pro His Gly Thr Met His Thr Trp Thr Gly Asp Pro Ala Gln Pro
305   310   315   320

Asn Asn Glu Asp Met Gly Asn Phe Tyr Ser Ala Ala Arg Asp Pro Ile
                325   330   335

Phe Phe Ala His His Gly Asn Ile Asp Arg Leu Trp His Val Trp Arg
            340   345   350

Gly Leu Arg Pro Gly Asn Ala Asp Phe Thr Asp Thr Asp Trp Leu Asp
        355   360   365

Thr Ala Phe Leu Phe Tyr Asp Glu Glu Ala Arg Pro Val Arg Val Arg
    370   375   380

Val Arg Asp Cys Leu Asp Pro Ala Ala Met Gly Tyr Ala Tyr Gln Asp
385   390   395   400

Val Gly Leu Pro Trp Leu Lys Ala Lys Pro Ala Lys Arg Ser Arg Arg
                405   410   415

Thr Pro Ala Pro Ala Ala Gly Ala Leu Pro Ala Thr Leu Arg Glu Thr
            420   425   430

Val Arg Val Thr Val Thr Arg Pro Gln Val Ser Arg Ser Asp Lys Glu
        435   440   445

Lys Glu Glu Ala Glu Glu Val Leu Ile Val Glu Gly Ile Gln Val Ala
    450   455   460

Asp His Phe Lys Phe Val Lys Phe Asp Val Leu Val Asn Ala Pro Glu
465   470   475   480

Ser Gly Gly Asp Ala Ala Ser Gly Tyr Cys Ala Gly Ser Val Ala Met
            485   490   495

Thr Pro His Met Val Arg Thr Asn Lys Lys Lys Gly Ser Val Lys Thr
            500   505   510

Val Ala Arg Phe Gly Val Cys Asp Leu Met Asp Asn Ile Gly Ala Asp
        515   520   525

12

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Gly Asp Lys Thr Val Val Val Ser Leu Val Pro Arg Cys Gly Gly Glu
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Leu Val Thr Ile Gly Gly Val Ser Ile Gly Tyr Thr Lys
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cttcttccct ttccatcgtt ggtatcttta tttctatgaa aggatcttgg ggagcttgat 180
caatgatcca acctttgccc ttccattttg gaactgggat gctcctaagg gcatgcaact 240
tccttccatt tacgcagacc ctaaatcacc cctttatgac actctccgca atgccaatca 300
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attgttcctt ggaaatcctt accgtgctgg ggatgagcct gacccgggtt ttggatcagt 480
agagaatgtt ccacatggcc ctgttcatct ttggnccggt gatatcaacc aacctaacat 540
tgngaacatg ggaactttct attcagctgc aggagacccc attttttatt ctcatcattc 600
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tgattcantt gggtaaaatc tgcgttctct tctacgatga taacaagaac cttgtgcntn 720
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<213>  Glycine max

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14

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Ala Tyr Cys Asp Gly Ala Tyr His Gln Val Gly Phe Pro Asp Leu Asp
               20                  25                  30

Leu Gln Val His Asn Ser Trp Leu Phe Phe Pro Phe His Arg Trp Tyr
        35                  40                  45

Leu Tyr Phe Tyr Glu Arg Ile Leu Gly Ser Leu Ile Asn Asp Pro Thr
    50                  55                  60

Phe Ala Leu Pro Phe Trp Asn Trp Asp Ala Pro Lys Gly Met Gln Leu
65                  70                  75                      80

Pro Ser Ile Tyr Ala Asp Pro Lys Ser Pro Leu Tyr Asp Thr Leu Arg
               85                  90                      95

Asn Ala Asn His Gln Pro Pro Thr Leu Val Asp Leu Asp Phe Asn Leu
            100                 105                 110

Glu Asp Pro Ile Ser Asn Gly Lys Ile Ser Asn Asn Leu Thr Ile Met
        115                 120                 125

Tyr Xaa Gln Val Val Ser Asn Gly Lys Thr Pro Thr Leu Phe Leu Gly
    130                 135                 140

Asn Pro Tyr Arg Ala Gly Asp Glu Pro Asp Pro Gly Phe Gly Ser Val
145                 150                 155                 160

Glu Asn Val Pro His Gly Pro Val His Leu Trp Xaa Gly Asp Ile Asn
            165                 170                 175

Gln Pro Asn Ile Xaa Asn Met Gly Thr Phe Tyr Ser Ala Ala Gly Asp
            180                 185                 190

Pro Ile Phe Tyr Ser His His Ser Asp Ile Asp Lys Met Trp Ser Ile
        195                 200                 205

Trp Lys Thr Leu Cys Gly Lys Arg Arg Asp Phe Thr Asp
    210                 215                 220

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<213>    Glycine max

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catcatattc ctagaatcac atgcagtgga aaccaaaaca atccaacacc aaaccctaat  180
tcccagggag aacctccaca tattgtagga cataggagga acgttctact tggcctagga  240
gggctttgtg gtgctgttac tcttaacaac aacaaccctt ttgcctttgc agctccaata  300
tctcctcctg acctaaacac gtgcggtcca ccagacctac ccgcaggtgt aaaacccacc  360
aattgttgcc ccccatcttc caaaatcata gatttcaagt tctctccctc taaccaaccc  420
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15

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<400> 18
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Ile Ser Pro Leu Ser Phe Val Pro Thr Val Asn Asn Val Ser Ser Asn
 1           5                  10                  15

Ser Ile Ala Pro Pro Ser Pro Leu His Pro Phe Ser Arg Phe Gln Ser
            20              25              30

Ile Lys Asn Arg Lys Pro Lys Pro His His Ile Pro Arg Ile Thr Cys
        35              40              45

Ser Gly Asn Gln Asn Asn Pro Thr Pro Asn Pro Asn Ser Gln Gly Glu
    50              55              60

Pro Pro His Ile Val Gly His Arg Arg Asn Val Leu Leu Gly Leu Gly
65              70              75                      80

Gly Leu Cys Gly Ala Val Thr Leu Asn Asn Asn Asn Pro Phe Ala Phe
            85              90              95

Ala Ala Pro Ile Ser Pro Pro Asp Leu Asn Thr Cys Gly Pro Pro Asp
            100             105             110

Leu Pro Ala Gly Val Lys Pro Thr Asn Cys Cys Pro Pro Ser Ser Lys
        115             120             125

Ile Ile Asp Phe Lys Phe Ser Pro Ser Asn Gln Pro Leu Arg Val Arg
    130             135             140

Pro Ala Ala His Leu Val Asn Asp Glu Tyr Leu Ala Lys Tyr Lys Lys
145             150             155             160

Ser Leu Asp Leu Met Lys Lys Leu Pro Ser Asp Asp Arg Val
                165             170
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<212> DNA
<213> Glycine max

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aaaaccccat catattccta gaatcacatg cagtggaaac caaaacaatc caacaccaaa  180
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cctaggaggg ctttgtggtg ctgttactct taacaacaac aaccctttg ccttttgcagc   300
tccaatatct cctcctgacc taaacacgtg cggtccacca gacctacccg caggtgtaaa  360
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caaaaaagcc cttgacctca tgaaaaaact ccctctgat gacccgcgta atttcaccca   540
acaagccaac gttcattgtg cttattgtga tggtgcatat caccaagttg ggttccctga  600
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caatctcgag gatcctattt ccaatggcaa aatttccaac aacctcacca taatgtatag  900
gcaagttgtg tctaacggga agactcctac attgttcctt ggaaatcctt accgtgctgg  960
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16

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gcgtaggtca agggttcaga aggtagcatt agcacaaaat tttggtgttg gtgcagcaca 1380
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Ser Ile Ala Pro Pro Ser Pro Leu His Pro Phe Ser Arg Phe Gln Ser
            20                  25                  30

Ile Lys Asn Arg Lys Pro Lys Pro His His Ile Pro Arg Ile Thr Cys
        35                  40                  45

Ser Gly Asn Gln Asn Asn Pro Thr Pro Asn Pro Asn Ser Gln Gly Glu
    50                  55                  60

Pro Pro His Ile Val Gly His Arg Arg Asn Val Leu Leu Gly Leu Gly
65                  70                  75                  80

Gly Leu Cys Gly Ala Val Thr Leu Asn Asn Asn Asn Pro Phe Ala Phe
                85                  90                  95

Ala Ala Pro Ile Ser Pro Pro Asp Leu Asn Thr Cys Gly Pro Pro Asp
            100                 105                 110

Leu Pro Ala Gly Val Lys Pro Thr Asn Cys Cys Pro Pro Ser Ser Lys
        115                 120                 125

Ile Ile Asp Phe Lys Phe Ser Pro Ser Asn Gln Pro Leu Arg Val Arg
    130                 135                 140

Pro Ala Ala His Leu Val Asn Asp Glu Tyr Leu Ala Lys Tyr Lys Lys
145                 150                 155                 160

Ala Leu Asp Leu Met Lys Lys Leu Pro Ser Asp Asp Pro Arg Asn Phe
                165                 170                 175

Thr Gln Gln Ala Asn Val His Cys Ala Tyr Cys Asp Gly Ala Tyr His
            180                 185                 190
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17

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Gln Val Gly Phe Pro Asp Leu Asp Leu Gln Val His Asn Ser Trp Leu
        195             200             205

Phe Phe Pro Phe His Arg Trp Tyr Leu Tyr Phe Tyr Glu Arg Ile Leu
    210             215             220

Gly Ser Leu Ile Asn Asp Pro Thr Phe Ala Leu Pro Phe Trp Asn Trp
225             230             235             240

Asp Ala Pro Lys Gly Met Gln Leu Pro Ser Ile Tyr Ala Asp Pro Lys
            245             250             255

Ser Pro Leu Tyr Asp Thr Leu Arg Asn Ala Asn His Gln Pro Pro Thr
            260             265             270

Leu Val Asp Leu Asp Phe Asn Leu Glu Asp Pro Ile Ser Asn Gly Lys
        275             280             285

Ile Ser Asn Asn Leu Thr Ile Met Tyr Arg Gln Val Val Ser Asn Gly
    290             295             300

Lys Thr Pro Thr Leu Phe Leu Gly Asn Pro Tyr Arg Ala Gly Asp Glu
305             310             315             320

Pro Asp Pro Gly Phe Gly Ser Val Glu Asn Val Pro His Gly Pro Val
            325             330             335

His Leu Trp Thr Gly Asp Ile Asn Gln Pro Asn Ile Glu Asn Met Gly
        340             345             350

Thr Phe Tyr Ser Ala Ala Arg Asp Pro Ile Phe Tyr Ser His His Ser
    355             360             365

Asn Ile Asp Arg Met Trp Ser Ile Trp Lys Thr Leu Gly Gly Lys Arg
370             375             380

Arg Asp Phe Thr Asp Ser Asp Trp Leu Glu Ser Ala Phe Leu Phe Tyr
385             390             395             400

Asp Glu Asn Lys Asn Leu Val Arg Val Lys Val Lys Asp Ser Leu Asp
            405             410             415

Thr Arg Lys Leu Gly Tyr Val Tyr Gln Asp Val Asp Ile Pro Trp Leu
            420             425             430

Asn Ser Lys Pro Thr Pro Arg Arg Ser Arg Val Gln Lys Val Ala Leu
    435             440             445

Ala Gln Asn Phe Gly Val Gly Ala Ala His Ala Ala Glu Thr Ser Arg
    450             455             460

Asn Val Lys Phe Pro Leu Val Leu Asp Ser Val Val Ser Thr Met Val
465             470             475             480

Lys Arg Pro Asn Lys Ser Arg Ser Lys Lys Glu Lys Glu Glu Glu Glu
            485             490             495

Glu Val Leu Val Ile Glu Gly Ile Glu Phe Glu Arg Asn Thr Pro Val
        500             505             510
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18

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Lys Phe Asp Val Phe Ile Asn Asp Glu Asp Asp Lys Gln Ile Arg Pro
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Asp Asn Thr Glu Phe Ala Gly Ser Phe Val Ser Val Pro His Ser His
        530                 535                 540

Met His Lys Asn Lys Asp Ile Ile Thr Cys Leu Arg Leu Gly Leu Thr
545                 550                 555                 560

Asp Leu Leu Glu Glu Leu Glu Ala Glu Asp Asp Asp Ser Val Arg Val
                565                 570                 575

Thr Leu Val Pro Arg Tyr Gly Lys Gly Arg Val Lys Ile Arg Gly Ile
            580                 585                 590

Lys Ile Glu Leu Leu Ser Asp
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aactagggta tgtttaccaa gatgtagaca ttccatggtt aaactctagg cccacaccgc  240
gaaggtctag ggttcaaaag gttgcactag cacaaaattt tggtgttggt gcagcacgtg  300
ctgctgagac ttcaaggaat gtgaagttcc cactagtgtt ggattcagtt gtgagcacaa  360
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ggattgaaaa ttatctatat gcttcaacta cttatatatg tgtgtgtggt aatacatata 780
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atatgctgat tcanttaata ctganaaata actaaaagat tatgctt          887


<210>  22
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<212>  PRT
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<222>  (11)
<223>  Xaa = any amino acid


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<220>
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His Met Lys Xaa Leu Val Gly Lys Gly Lys Asp Phe Thr Asp Ser Asp
              20                  25                  30

Trp Leu Glu Ser Gly Phe Leu Phe Tyr Asp Glu Asn Lys Asn Leu Val
           35                  40                  45

Arg Val Lys Val Lys Asp Cys Leu Asp Glu Arg Lys Leu Gly Tyr Val
        50                  55                  60

Tyr Gln Asp Val Asp Ile Pro Trp Leu Asn Ser Arg Pro Thr Pro Arg
 65                  70                  75                  80

Arg Ser Arg Val Gln Lys Val Ala Leu Ala Gln Asn Phe Gly Val Gly
                 85                  90                  95

Ala Ala Arg Ala Ala Glu Thr Ser Arg Asn Val Lys Phe Pro Leu Val
              100                 105                 110

Leu Asp Ser Val Val Ser Thr Met Val Lys Arg Pro Asn Lys Ser Arg
           115                 120                 125

Ser Lys Lys Glu Lys Glu Glu Glu Glu Glu Val Leu Val Ile Glu Gly
        130                 135                 140

Ile Glu Phe Glu Arg Asn Thr Pro Val Lys Phe Asp Val Phe Ile Asn
145                 150                 155                 160
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20

Asp Glu Asp Asp Lys Gln Ile Arg Pro Asp Asn Thr Glu Phe Ala Gly
            165   170   175

Ser Phe Val Ser Val Pro His Ser His Met His Lys Asn Lys Asp Ile
            180   185   190

Ile Thr Cys Leu Arg Leu Gly Leu Thr Asp Leu Leu Glu Glu Leu Glu
            195   200   205

Ala Glu Asp Asp Asp Ser Val Arg Val Thr Leu Val Pro Arg Tyr Gly
    210   215   220

Lys Gly Arg Val Lys Ile Lys Arg His Gln Asn Arg Ala Ser Phe Gly
225   230   235   240

Leu Lys Ile Ile Tyr Met Leu Gln Leu Leu Ile Tyr Val Cys Val Val
            245   250   255

Ile His Ile Trp Leu Leu Xaa Phe Gln
            260   265

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atcacattcc tagaaccaca tgcagtgaaa accaaaacaa tccaacacca aacccatccg 180
aaggagaact atcacatatt gtaggacata ggaggaatgt tctacttggc ctaggagggc 240
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gttgcccccc atcttccaaa aatcatagat ttcaaaggtt ccctccttct aaaccaaccc 420
cttgagggta agaccaagcg ggcacatttg ggtcaaaccg atgaaataat ctaagccnaa 480
aatacaaaaa aaggcccttt gacctcaatg   510

<210>   24
<211>   138
<212>   PRT
<213>   Glycine max

<400>   24
Pro Phe Ser Phe Val Ser Val Val Asn Asn Ala Ser Ser Asn Ser Ser
  1   5   10   15

Thr Thr Pro Pro Ser Ser Leu His Pro Ile Ser Gln Phe Gln Ser Thr
            20   25   30

Lys Asn Arg Lys Pro Lys Arg His His Ile Pro Arg Thr Thr Cys Ser
            35   40   45

Glu Asn Gln Asn Asn Pro Thr Pro Asn Pro Ser Glu Gly Glu Leu Ser
    50   55   60

21

```
His Ile Val Gly His Arg Arg Asn Val Leu Leu Gly Leu Gly Gly Leu
 65                  70              75                  80

Cys Gly Ala Val Thr Leu Asn Asn Asn Pro Phe Ala Phe Ala Ala Pro
             85                  90              95

Ile Ser Pro Pro Asp Leu Asn Thr His Val Val His Gln Thr His Pro
            100             105             110

Arg Val Gln Ile Pro Pro Ile Cys Cys Pro Pro Ser Ser Lys Asn His
        115             120             125

Arg Phe Gln Arg Phe Pro Pro Ser Lys Pro
    130             135
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<210> 25
<211> 988
<212> DNA
<213> Glycine max

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<222> (962)
<223> n = a, c, g or t

<220>
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<222> (970)..(971)
<223> n = a, c, g or t

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ccatcatcat attcctagag tgacatgcag tgacaaccaa aaaccaaaca catctggaga  180
actagtactc ccacatagga ggaacattct acttggccta ggagggcttt gtggtgctgc  240
tgctactctt aacaacatcc cttttgccaa tgctgcccca atacttggtc cagacctaac  300
cacatgtgtt caagcagaac tacccgaagg tgtagaaccc accaattgtt gtcccccaat  360
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cgctgctcat ctggtcaaca aagactatct agctaaatac gagaaagccg ttaacctgat  480
gaaaaatctc ccgtcagatg atccacgtag tttcgcgcaa caagccaaag ttcattgtgc  540
ttattgcgac ggtggatatc accaactagg cttccctgac cttgatctcg aagtgcactt  600
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gagcttgatc aatgatccaa cctttgctct tccattttgg aactgggatg ctcctggggg  720
catgcaactt ccttccatgt acgcagatcc caaatcaccc ctttatgatt ctctacgcaa  780
tgccaaccat caaccaccaa cacttgtaaa ccttgacttt actatcgagg atcctaatgc  840
agaggcaaat atctccacca acctcaccac aatgtatagg caagcttgtg tctaacgcaa  900
agactccaac attgttcttc ggaaatcctt atcgtgctgg ggatcagcta accctggtgg  960
gnggtccgtn nagagcactc cacatggg                                     988
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<210> 26
<211> 274
<212> PRT
<213> Glycine max

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Ser Pro Ile Ser Phe Val Ser Ala Ile Asn Asn Val Ser Ser Asn Ser
  1               5                  10                  15

Ser Asn Ser Pro Ser Ser Leu His His Pro Phe Ser Gln Ile Gln Ser
```

22

Ala Lys Tyr Arg Lys Pro Lys Arg His His His Ile Pro Arg Val Thr
        35   40   45

Cys Ser Asp Asn Gln Lys Pro Asn Thr Ser Gly Glu Leu Val Leu Pro
        50   55   60

His Arg Arg Asn Ile Leu Leu Gly Leu Gly Gly Leu Cys Gly Ala Ala
 65   70   75   80

Ala Thr Leu Asn Asn Ile Pro Phe Ala Asn Ala Ala Pro Ile Leu Gly
            85   90   95

Pro Asp Leu Thr Thr Cys Val Gln Ala Glu Leu Pro Glu Gly Val Glu
        100   105   110

Pro Thr Asn Cys Cys Pro Pro Ile Ser Thr Asn Ile Ile Asp Phe Lys
        115   120   125

Phe Pro Pro Ser Asn Gln Pro Leu Arg Val Arg Ser Ala Ala His Leu
    130   135   140

Val Asn Lys Asp Tyr Leu Ala Lys Tyr Glu Lys Ala Val Asn Leu Met
145   150   155   160

Lys Asn Leu Pro Ser Asp Asp Pro Arg Ser Phe Ala Gln Gln Ala Lys
            165   170   175

Val His Cys Ala Tyr Cys Asp Gly Gly Tyr His Gln Leu Gly Phe Pro
            180   185   190

Asp Leu Asp Leu Glu Val His Phe Ser Trp Leu Phe Phe Pro Tyr His
        195   200   205

Arg Trp Tyr Leu Tyr Phe His Glu Arg Ile Leu Ala Ser Leu Ile Asn
    210   215   220

Asp Pro Thr Phe Ala Leu Pro Phe Trp Asn Trp Asp Ala Pro Gly Gly
225   230   235   240

Met Gln Leu Pro Ser Met Tyr Ala Asp Pro Lys Ser Pro Leu Tyr Asp
            245   250   255

Ser Leu Arg Asn Ala Asn His Gln Pro Pro Thr Leu Val Asn Leu Asp
            260   265   270

Phe Thr

<210> 27
<211> 2044
<212> DNA
<213> Glycine max

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caaaacgcca tcatcatatt cctagagtga catgcagtga caaccaaaaa ccaaacacat   180
ctggagaact agtactccca cataggagga acattctact tggcctagga gggctttgtg   240

23

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gtgctgctgc tactcttaac aacatccctt ttgccaatgc tgccccaata cttggtccag  300
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ccccaatttc cacaaacatc atagatttca agttccctcc ctccaaccaa cccttgcgtg  420
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attcgcatga gcatcacaaa aacaacaaga agattgttac ttgtttgagg ttgggactaa 1680
cggatttgtt ggaagaattg ggagcagaag atgatgatag tgttctagta acattggttc 1740
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<210> 28
<211> 599
<212> PRT
<213> Glycine max

<400> 28

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 1               5                  10                  15

Asn Ser Ser Asn Ser Pro Ser Ser Leu His His Pro Phe Ser Gln Ile
            20                  25                  30

Gln Ser Ala Lys Tyr Arg Lys Pro Lys Arg His His His Ile Pro Arg
        35                  40                  45

Val Thr Cys Ser Asp Asn Gln Lys Pro Asn Thr Ser Gly Glu Leu Val
    50                  55                  60

Leu Pro His Arg Arg Asn Ile Leu Leu Gly Leu Gly Gly Leu Cys Gly
65                  70                  75                  80

Ala Ala Ala Thr Leu Asn Asn Ile Pro Phe Ala Asn Ala Ala Pro Ile
                85                  90                  95

Leu Gly Pro Asp Leu Thr Thr Cys Val Gln Ala Glu Leu Pro Glu Gly
            100                 105                 110

Val Glu Pro Thr Asn Cys Cys Pro Pro Ile Ser Thr Asn Ile Ile Asp
```

24

Phe Lys Phe Pro Pro Ser Asn Gln Pro Leu Arg Val Arg Ser Ala Ala
    130   135   140

His Leu Val Asn Lys Asp Tyr Leu Ala Lys Tyr Glu Lys Ala Val Asn
145   150   155   160

Leu Met Lys Asn Leu Pro Ser Asp Asp Pro Arg Ser Phe Ala Gln Gln
                165   170   175

Ala Lys Val His Cys Ala Tyr Cys Asp Gly Gly Tyr His Gln Leu Gly
            180   185   190

Phe Pro Asp Leu Asp Leu Glu Val His Phe Ser Trp Leu Phe Phe Pro
        195   200   205

Tyr His Arg Trp Tyr Leu Tyr Phe His Glu Arg Ile Leu Ala Ser Leu
    210   215   220

Ile Asn Asp Pro Thr Phe Ala Leu Pro Phe Trp Asn Trp Asp Ala Pro
225   230   235   240

Gly Gly Met Gln Leu Pro Ser Met Tyr Ala Asp Pro Lys Ser Pro Leu
                245   250   255

Tyr Asp Ser Leu Arg Asn Ala Asn His Gln Pro Pro Thr Leu Val Asn
        260   265   270

Leu Asp Phe Thr Ile Glu Asp Pro Asn Ala Glu Ala Asn Ile Ser Thr
        275   280   285

Asn Leu Thr Thr Met Tyr Arg Gln Leu Val Ser Asn Ala Lys Thr Pro
    290   295   300

Thr Leu Phe Phe Gly Asn Pro Tyr Arg Ala Gly Asp Gln Pro Asn Pro
305   310   315   320

Gly Gly Gly Ser Val Glu Ser Thr Pro His Gly Pro Val His Ala Trp
                325   330   335

Thr Gly Asp Ile Asn His Pro Thr Met Glu Asp Met Gly Asn Leu Tyr
            340   345   350

Ala Ala Ala Arg Asp Pro Ile Phe Tyr Cys His His Ser Asn Val Asp
        355   360   365

Arg Met Trp Ser Ile Trp Lys Thr Leu Gly Gly Lys Arg Arg Asp Leu
    370   375   380

Thr Asp Pro Asp Trp Leu Glu Ser Ala Phe Leu Phe Tyr Asp Glu Asn
385   390   395   400

Lys Asn Leu Val Arg Val Lys Thr Lys Asp Cys Leu Asp Thr Arg Lys
                405   410   415

Leu Gly Tyr Val Tyr Gln Asp Val Asp Ile Pro Trp Leu Lys Ser Lys
            420   425   430

Pro Thr Pro Leu Arg Ser Arg Ala Gln Lys Val Glu Leu Thr Pro Leu

```
                435                     440                     445
Phe Gly Gly Val Ala Ala Ala His Ala Ala Glu Thr Ser Arg Asn Val
    450                 455                 460

Lys Phe Pro Leu Val Leu Asp Ser Val Val Ser Thr Val Val Lys Arg
465                 470                 475                 480

Pro Lys Lys Ser Arg Ser Lys Lys Glu Lys Glu Glu Lys Glu Glu Ile
            485                 490                 495

Leu Val Val Glu Gly Ile Glu Phe Glu Ser Ser Thr Gly Val Lys Phe
            500                 505                 510

Asp Val Phe Ile Asn Asp Glu Asp Asp Lys Leu Val Lys Pro Asp Asn
    515                 520                 525

Thr Glu Phe Ala Gly Ser Phe Val Ser Val Pro His Ser His Glu His
    530                 535                 540

His Lys Asn Asn Lys Lys Ile Val Thr Cys Leu Arg Leu Gly Leu Thr
545                 550                 555                 560

Asp Leu Leu Glu Glu Leu Gly Ala Glu Asp Asp Asp Ser Val Leu Val
            565                 570                 575

Thr Leu Val Pro Lys Tyr Gly Lys Gly Arg Val Asn Ile Arg Gly Ile
            580                 585                 590

Lys Ile Asp Phe Val Ser Asp
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<212> DNA
<213> Glycine max

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<220>
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<223> n = a, c, g or t

<220>
<221> unsure
<222> (555)
<223> n = a, c, g or t

<220>
<221> unsure
<222> (570)
<223> n = a, c, g or t

<220>
<221> unsure
<222> (588)

26

<223>   n = a, c, g or t

<220>
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<222>   (590)
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catgcaaacc caccaaacgt agcaaaccaa aacgccacca cgtttcgaaa gtgacatgca 180
acagtaacca aaacacccca acaccaaacc cagaagaaga aagaccatca tacaacattc 240
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ttagcaacac caacccttta gccatggctg cagctcctat tctagagcct gacctagaac 360
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gcccaccaag atcttcttcc cctcctatag atttcaagtt gcctaaagga acaccctnan 480
ggttagacca cctgctcaat tcgtcactga tggagtacct agaaaagtag aagttagccc 540
ttaagcgcat ggganagttc catctgatgn tctcgagttc aggaacangn tggtatcaat 600
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ctggcggtct ccctncacgt tggac   685

<210>   30
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<212>   PRT
<213>   Glycine max

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<222>   (155)..(156)
<223>   Xaa = any amino acid

27

<220>
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<222>   (172)
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Met Ala Ser Ile Ser Cys Leu Ser Ser Phe Ser Leu Ser Asn Phe Ser
  1   5   10   15

Ala Pro Leu Pro Ile Ser Ile Cys Ser Ser Ser Ser Thr Phe Leu Thr
                 20   25   30

Ser Gln Ile Pro Cys Lys Pro Thr Lys Arg Ser Lys Pro Lys Arg His
             35   40   45

His Val Ser Lys Val Thr Cys Asn Ser Asn Gln Asn Thr Pro Thr Pro
         50   55   60

Asn Pro Glu Glu Glu Arg Pro Ser Tyr Asn Ile Leu Gly Lys Tyr Arg
 65   70   75   80

Arg Asp Val Leu Leu Gly Ile Gly Gly Leu Tyr Gly Ala Ser Ala Leu
             85   90   95

Ser Asn Thr Asn Pro Leu Ala Met Ala Ala Pro Ile Leu Glu Pro
             100   105   110

Asp Leu Glu His Cys Cys Ile Thr Asp Asp Val Pro Pro Lys Gly Val
         115   120   125

Ile Glu Ala Gln Val Tyr Cys Cys Pro Pro Arg Ser Ser Ser Pro Pro
     130   135   140

Ile Asp Phe Lys Leu Pro Lys Gly Thr Pro Xaa Xaa Leu Asp His Leu
145   150   155   160

Leu Asn Ser Ser Leu Met Glu Tyr Leu Glu Lys Xaa Lys Leu Ala Leu
             165   170   175

Lys Arg Met

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<212>   DNA
<213>   Glycine max

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caaataccat gcaaaccctc caaacgtagc aaaccaaaag gccatcatgt ttccaaagtg   180
tcatgcaaca gtaaccaaaa caccccaaca ccaaacccag aagaagaaaa accatcgtca   240
tacaacattc taggaaaaca taggagggat attctccttg gcattggggg cctttacggt   300
gcttctgctc ttagcaacac caacccttta gccatggctg cagctcctat tctagagcct   360
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<210> 32
<211> 619
<212> PRT
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<400> 32

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Ala Pro Leu Pro Ile Ser Ile Cys Ser Ser Ser Ser Ala Phe Leu Thr
            20                  25                  30

Ser Gln Ile Pro Cys Lys Pro Ser Lys Arg Ser Lys Pro Lys Gly His
        35                  40                  45

His Val Ser Lys Val Ser Cys Asn Ser Asn Gln Asn Thr Pro Thr Pro
    50                  55                  60

Asn Pro Glu Glu Glu Lys Pro Ser Ser Tyr Asn Ile Leu Gly Lys His
65                  70                  75                  80

Arg Arg Asp Ile Leu Leu Gly Ile Gly Gly Leu Tyr Gly Ala Ser Ala
                85                  90                  95

Leu Ser Asn Thr Asn Pro Leu Ala Met Ala Ala Ala Pro Ile Leu Glu
            100                 105                 110

Pro Asp Leu Glu His Cys Cys Ile Thr Asp Asp Val Pro Lys Gly Glu
        115                 120                 125

Ile Glu Lys Gln Val Tyr Cys Cys Pro Pro Lys Ser Ser Ser Pro Pro
    130                 135                 140

Ile Asp Phe Lys Leu Pro Lys Gly Thr Pro Leu Arg Val Arg Pro Pro
145                 150                 155                 160
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29

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Ala Gln Phe Val Thr Asp Glu Tyr Leu Glu Lys Tyr Lys Leu Ala Leu
            165                 170             175

Lys Arg Met Arg Glu Leu Pro Ser Asp Asp Pro Arg Ser Phe Lys Gln
            180                 185             190

Gln Ala Asp Ile His Cys Ala Tyr Cys Asp Gly Gly Tyr Lys Gln Leu
            195                 200             205

Gly Phe Pro Val Glu Leu Asp Phe Lys Val His Phe Ser Trp Ile Phe
    210                 215             220

Phe Pro Phe His Arg Trp Tyr Leu Tyr Phe Tyr Glu Arg Ile Leu Gly
225                 230             235                 240

Ser Leu Ile Asp Asp Pro Thr Phe Ala Leu Pro Tyr Trp Asn Trp Asp
            245                 250             255

Asn Pro Asp Gly Gly Met Val Leu Pro Ser Ile Phe Ala Asp Glu Asp
            260                 265             270

Ser Pro Leu Tyr Asp Pro Arg Arg Asn Pro Asp Ile Thr Pro Thr Thr
            275                 280             285

Leu Val Asp Leu Asn Tyr Gly Ser Gly Lys Glu Pro Ser Val Glu Gln
            290                 295             300

Asn Leu Gly Val Met Tyr Thr Ser Val Val Ser Gly Ala Lys Arg Ala
305                 310             315                 320

Ser Leu Phe His Gly Lys Pro Phe Leu Ala Gly Lys Gln Pro Glu Leu
                325                 330             335

Ser Gly Gly Thr Val Glu Leu Gly Pro His Thr Ala Val His Arg Trp
            340                 345             350

Thr Gly Asp Pro Arg Gln Pro Asn Lys Glu Asp Met Gly Arg Phe Tyr
            355                 360             365

Ser Ala Gly Arg Asp Pro Ala Phe Tyr Ser His His Ala Asn Val Asp
    370                 375             380

Arg Met Trp Asn Ile Trp Lys Thr Ile Pro Ser Gly Lys Arg Arg Asp
385                 390             395                 400

Phe Lys Asn Arg Asp Trp Leu Glu Thr Ser Phe Phe Phe Tyr Asp Glu
                405                 410             415

Asn Lys Thr Leu Val Arg Val Lys Val Lys Asp Ser Leu Asp Thr Asn
            420                 425             430

Lys Met Gly Tyr Val Tyr Gln Asp Val Ala Ile Pro Trp Leu Glu Lys
            435                 440             445

Lys Pro Lys Pro Lys Arg Thr Arg Lys Ala Lys Lys Val Ala Phe Ala
    450                 455             460

Gln Gln Phe Gly Gly Ile Gly Ala Ala Met Ala Ala Glu Thr Gly Pro
465                 470             475             480
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30

Ser Ser Lys Phe Pro Leu Thr Leu Leu Asp Ser Lys Val Thr Leu Leu
            485   490   495

Val Lys Arg Pro Lys Gln Leu Arg Ser Lys Arg Asp Lys Glu Glu Glu
            500   505   510

Glu Glu Val Leu Val Ile Asp Gly Ile Glu Phe Asp Gly Asp Asp Asp
            515   520   525

Val Lys Phe Asp Val Tyr Ile Thr Asp Glu Asp Val Glu Asp Ile Gly
            530   535   540

Pro Glu Ser Thr Glu Phe Ala Gly Ser Phe Ser Thr Leu Gly His Ser
545   550   555   560

His Ser Asn Met Asn Met Asp Lys Lys Ile Lys Thr Ser Leu Thr Leu
                565   570   575

Gly Ile Thr Asp Leu Leu Glu Asp Leu Asp Ala Glu Asn Asp Asp Ser
                580   585   590

Val Leu Val Thr Leu Val Pro Arg Ser Glu Asn Val Thr Ile Thr Ile
            595   600   605

Gln Asn Ile Lys Ile Glu Phe Glu Lys Asp Glu
            610   615

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tgcaatggta accctagaaa taggagggac attctgatcg gccttggagg actctatggt   180
gctacaacaa gtctcacaag taacaacact ggttctgcat ttggtgcttc attgtcgcct   240
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31

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Arg Arg His Ala Trp Glu Val Ala Cys Asn Gly Asn Pro Arg Asn Arg
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Arg Asp Ile Leu Ile Gly Leu Gly Gly Leu Tyr Gly Ala Thr Thr Ser
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Leu Thr Ser Asn Asn Thr Gly Ser Ala Phe Gly Ala Ser Leu Ser Pro
 65                  70                  75                  80

Pro Asp Pro Thr Asn Cys Val Gln Pro Asp Pro Glu Lys Asp Pro Phe
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Cys Pro Pro Pro Pro Phe Lys Asp Tyr Glu Leu Pro Pro His Asp Asp
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Lys Thr Leu Pro Leu Arg Ile Arg Pro Ala Ala His Leu Val Thr Asp
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Asp Tyr Ile Ala Lys Tyr Glu Glu Ala Val Arg Arg Met Gln Asp Leu
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Pro Pro Asp Asp Pro Arg Ser Phe Met Gln Gln Ala Asn Val His Arg
145                 150                 155                 160

Ala Tyr Cys Asp Gly Arg Gly Tyr Thr Gln Lys Gly Phe Ala Asp Tyr
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Lys Leu Asp Val His Gly Ser Trp Ile Phe Phe Pro Trp His Arg Trp
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Tyr Leu Tyr Phe Tyr Glu Lys Ile Leu Gly Lys Met Ile Gly Asp Pro
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Thr Phe Ala Leu Pro Phe Trp Asn Trp Asp Asn Pro Ala Gly Met Arg
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Ile Pro Pro Ile Phe Thr Asp Lys Ser Ser Pro Leu Tyr Asp Glu His
225                 230                 235                 240

Arg Asn Ser Asp His Val Asn Ala Phe Ile Asp Leu Asp Tyr Lys Lys
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32

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Asp Asp Ser Pro Val Lys Pro Pro Gln Thr Ile Leu Trp Pro Pro Val
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Glu Lys Lys Asn Asn Ser Ile Val Asp Asn Leu Ile Val Asn Asn Leu
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Ile Lys Val Tyr Thr Ala Val Ala Ser Lys Thr Asn Ser Ser Pro Asp
        290             295             300

Tyr Phe Leu Gly Pro Ala Phe Glu Ala Gly Ser Ala Pro Gln Gln His
305             310             315                         320

Phe Gly Ser Leu Glu Ser Leu His Asn Thr Val His Ser Trp Thr Gly
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Glu Arg Glu Asn Asn His His Asp Met Gly Leu Leu Ala Thr Ala Ala
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Lys Asp Pro Ile Phe Phe Ala His His Ser Asn Val Asp Arg Met Trp
        355             360             365

Asn Ile Trp Lys Thr Glu Leu Leu Asp Gly Arg Arg Phe Asp His Lys
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Ser Asp Asp Trp Leu Glu Ser Ser Phe Phe Phe Tyr Asp Glu Asn Lys
385             390             395                         400

Asn Tyr Val Arg Val Lys Val Lys Asp Cys Leu Asp Ser Lys Lys Met
                405             410             415

Gly Tyr Asp Tyr Gln Arg Val Asp Leu Pro Trp Leu Leu Ala Gly Glu
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Leu Ile Lys Pro Lys Lys Glu Ile Ile Leu Leu Arg Ser Lys Pro Glu
        435             440             445

Ala Ser Thr Phe Lys Thr Leu Gln Leu Pro Leu Pro Leu Glu Ser Ile
    450             455             460

Glu Arg Thr Asn Val Lys Arg Pro Lys Pro Arg Ser Arg Asn Glu Asn
465             470             475                         480

Glu Glu Glu Glu Glu Gly Val Glu Glu Val Leu Val Ile Asp Val Glu
            485             490             495

Tyr Asp Ser Thr Asp Gly Val Arg Phe Asp Val Phe Ile Asn Asp Gln
            500             505             510

Gly Asp Asn Glu Ile Gly Pro Gln Asp Ser Glu Phe Ala Gly Ser Phe
        515             520             525

Val Thr Leu Pro His Ser Pro His Val Asn His Asn Asn Ile Thr Lys
    530             535             540

Ala Ser Phe Lys Leu Pro Leu Thr Tyr Lys Leu Lys Asp Leu Gly Val
545             550             555                         560

Thr Lys Asp Asp Asp Ser Ile Ser Val Thr Leu Ala Pro Ile Tyr Gly
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33

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Glu Val Asp Asp Glu
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Thr Ile Lys Thr Ile Ser Tyr Leu Val Ser Phe Ser Glu Lys Pro Asn
            35   40   45

His Tyr Ser Asn Phe Ser Ile Ile Pro Tyr Lys Ala Gln Asn Ser Lys
        50   55   60

Gln Asn Gly His Ile Thr Thr Asn Ser Asn Gly Arg Asp Lys Pro Arg
65   70   75   80

Leu Trp Arg Lys Ala Phe Ile Gly Phe Lys Asn Thr His Glu Pro Ser
                85   90   95

Ser Asn Ile Ser Arg Ala Ile Ser Leu Asn Val Ser Lys Cys Phe Pro
            100   105   110

Val Glu Leu Pro Ser Phe Ala Ile Thr Asn Ser His Cys Cys Pro Pro
        115   120   125

Arg Pro Pro Pro Ser Lys Ile Ile Asp Phe Lys Asp Phe Ala Ser Pro
    130   135   140

Asn Ala Thr Leu Arg Val Arg Lys Pro Ala His Met Val Asp Glu Glu
145   150   155   160

Tyr Ile Ala Lys Leu Glu Lys Gly Ile Ala Leu Met Lys Ala Leu Pro
            165   170   175

Asp Asp Asp Pro Arg Asn Phe Ile Gln Gln Ala Lys Val His Cys Ala
            180   185   190

Tyr Cys Asn Gly Ala Tyr His Leu Pro His Pro Phe Gln Asn Thr Lys
        195   200   205

Leu Asn Ile His Arg Ser Trp Phe Phe Phe Pro Phe His Arg Trp Tyr
    210   215   220

Ile Tyr Phe Phe Glu Arg Ile Leu Gly Ser Leu Leu Gly Asp Pro Asn
225   230   235   240

Phe Ala Leu Pro Phe Trp Asn Trp Asp Ala Val Glu Gly Met Gln Met
            245   250   255

Pro Pro Tyr Phe Ala Asn Pro Asn Ser Ser Leu Tyr His Lys Leu Arg
            260   265   270

Asn Pro Lys His Leu Pro Pro Gln Val Val Asp Leu Asn Tyr Asp Pro
        275   280   285

Phe Asp Phe Asn Asp Asp Thr Pro Ser His Gln Gln Val Ser Tyr Asn
    290   295   300

Leu Ala Phe Met Tyr Lys Gln Met Val Leu Ala Ser Thr Lys Glu Leu
305   310   315   320

Phe Met Gly Ser Pro Phe Arg Leu Gly Asp Asn Pro Thr Pro Gly Ile

35

Gly Ser Ile Glu Ala Ala Pro His Asn Thr Val His Lys Trp Val Gly
              340   345   350

Ala Ala Asp Lys Pro His Gln Glu Asp Met Gly Thr Phe Tyr Thr Ala
              355   360   365

Ala Arg Asp Pro Val Phe Tyr Pro His His Thr Asn Ser Asp Arg Leu
        370   375   380

Trp Gly Ile Trp Lys Lys Leu Gly Glu Gly Arg Lys Asp Tyr Ser Asp
385   390   395   400

Asp Pro Asp Trp Leu Asp Ser Asp Phe Tyr Phe Tyr Asp Glu Asn Ala
              405   410   415

Asn Phe Val Arg Val Lys Val Arg Asp Cys Phe Asp Thr Lys Arg Leu
              420   425   430

Gly Tyr Val Tyr Glu Asp Val Asp Leu Pro Trp Leu Arg Thr Pro Pro
        435   440   445

Thr Ser Arg Lys Ser Lys Leu Leu Arg Glu Ala Lys Lys Gly Ser Leu
        450   455   460

Leu Ser Ser Lys Pro Trp Lys Phe Pro Leu Val Leu Asp Ser Ile Thr
465   470   475   480

Ser Ile Val Val Lys Arg Pro Lys Lys Trp Arg Ser Lys Glu Glu Lys
              485   490   495

Glu Gln Glu Glu Glu Val Leu Val Ile Glu Gly Ile Glu Phe Gly Ser
              500   505   510

Asp Lys Tyr Val Lys Phe Asp Val His Ile Asp Asp Asp Glu Asp Asn
        515   520   525

Leu Ser Gly Pro Asp Glu Thr Glu Phe Val Gly Ser Phe Val Asn Val
        530   535   540

Gln His Gly His Gly His Asn Val Lys Thr Ser Phe Lys Val Gly Ile
545   550   555   560

Ser Lys Val Leu Glu Ser Val Glu Ala Glu Glu Asp Asp Glu Val Leu
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Val Ser Leu Val Pro Lys Val Gly Lys Gly Asp Ala Ile Ile Gly Gly
              580   585   590

Ile Lys Ile Glu Phe Ile Pro Lys Tyr
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Leu Leu Asp Xaa Asp Tyr Leu Lys Lys Pro Arg Arg Asp Thr Ile Pro
            20   25   30

Phe Glu Pro Pro Thr Asp Pro Ala Ala Arg Ala Lys Tyr Asp Asp Ala
        35   40   45

Val Gln Thr Asn Leu Cys Thr Ile Tyr Leu Gln Gln Val Arg Asp Gly
    50   55   60

Lys Gly Pro Arg Ala Phe Leu Gly Glu Lys Leu Cys Ser Asp Gln Gly
65   70   75   80

Thr Leu Glu Arg Met Ala His Thr Thr Val His Val Trp Thr Gly Arg
                85   90   95

Ala Asn Pro Ala Thr Cys Ser Ala Glu Gln Gly Gly Val Val Gly His
            100   105   110

Asp Gly Lys Pro His Cys Gln Val Asp Met Gly Phe Leu Gly Thr Ala
        115   120   125

Gly Arg Asp Pro Leu Phe Tyr Ser His His Ala Asn Val Asp Arg Met
    130   135   140

Trp His Ile Trp Ser Thr Arg Leu Gly Gly Lys Gly Phe Asp Asp Pro
145   150   155   160

Glu Trp Leu Asp Thr Ser Phe Val Phe Tyr Asp Asp Tyr Arg Ser Arg
            165   170   175

Gly Trp Xaa Gln Met Lys Phe Arg Asp Val Leu Asn Ala Thr Arg Leu
        180   185   190

Gly Tyr Thr Tyr Asp Lys Glu Ser Glu Ala Ala Leu Pro Trp Leu Asn
    195   200   205

Ser Lys Pro Thr Arg Phe Ser Gly Gly Gly Lys Ala Lys Ala Lys Ala
    210   215   220

Ala Pro Lys Val Ala Ser Glu Phe Pro Leu Thr Leu Thr Asp Glu Ala
225   230   235   240

Val Asp Val Pro Ala Val Ala Val Pro Ala Arg Gln Ala Gly Lys Asp
            245   250   255

Leu Val Leu Leu Ile Glu Gly Ile Glu Tyr Asp Pro Gln Ile Asn Asn
        260   265   270

Lys Phe Asp Val Val Ile Asn Val Ala Arg Glu Asp Ala Ala Arg Val
        275   280   285

Gly Pro Lys Asp Ser Glu Tyr Ala Gly Ser Phe Ser Ala Val Pro Ser
    290   295   300

Ser Asn Ala Ala Gly Gly Thr Leu Val Gly Lys Phe Thr Leu Ala Leu
305   310   315   320

Asp Gly Val Leu Ala Asp Leu Gly Leu Ala Gly Ala Ser Ala Val Asp
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Ile Val Leu Val Pro His Thr Glu Gly Glu Ile Lys Leu Tyr Leu Pro
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Pro Thr Ile Glu Asn Ala
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38

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<212> PRT
<213> Zea mays

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            20   25   30

Ala Thr Cys Arg Ala Ser Ser Gly Gly Gly Gly Gly Arg Gly Gly Glu
        35   40   45

39

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Asn Asp Gly Leu Leu Trp Leu Pro Arg Arg Asp Val Met Leu Asn Gly
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Leu Ser Ser Val Ala Ala Gly Leu Ala Trp Tyr Pro Gly Val Ala Ser
65                  70                  75                      80

Gly Ala Asp Ala Val Cys Thr Arg Ala Asp Lys Val Asn Glu Lys Thr
            85                  90                  95

Val Gln Cys Thr Asp Pro Ala Gly Gln Leu Pro Cys Pro Leu Val Ser
            100                 105                 110

Pro Thr Asp Pro Val Asp Phe Lys Pro Glu Ser Lys Val Thr Arg Ile
        115                 120                 125

Arg Gln Pro Val His Leu Leu Ser Arg Glu Tyr Gln Glu Lys Tyr Lys
    130                 135                 140

Glu Ala Val Ala Lys Met Lys Ala Leu Pro Glu Glu Asn Pro Leu Ser
145                 150                 155                 160

Phe Ala Ala Gln Ala Ala Ile His Gln Ala Tyr Cys Asp Ala Tyr Tyr
            165                 170                 175

Lys Tyr Asp Pro Thr Ala Lys Asp Ala Pro Phe Asp Val His Phe Ser
        180                 185                 190

Trp Ile Phe Ala Pro Trp His Arg Met Tyr Ile Tyr Phe Tyr Glu Arg
        195                 200                 205

Ala Leu Gly Gln Leu Ile Gly Asp Asp Thr Phe Ala Leu Pro Phe Trp
    210                 215                 220

Asn Trp Asp Thr Pro Ala Gly Met Val Val Pro Pro Leu Phe Lys Asp
225                 230                 235                 240

Ser Met Gly Asn Pro Leu Tyr Asp Pro Asn Arg Asn Pro Ser Asn Val
            245                 250                 255

Asp Ala Leu Val Asp Leu Asp Tyr Leu Asn Asp Arg Asn Ala Glu Pro
            260                 265                 270

Ile Pro Phe Lys Gly Pro Arg Asp Glu Lys Tyr Lys Glu Leu Val Asn
        275                 280                 285

Lys Asn Leu Cys Thr Val Tyr Thr Gln Gln Ile Arg Ser Gly Lys Gly
    290                 295                 300

Ala Glu Ser Phe Leu Gly Glu Lys Tyr Cys Thr Asp Ile Gly Ser Ser
305                 310                 315                 320

Thr Ser Ser Met Gly Ser Leu Glu Arg Met Ala His Thr Ala Val His
            325                 330                 335

Val Trp Val Gly Lys Ala Gly Pro Thr Pro Ser Ser Glu Ala Cys Ser
            340                 345                 350

Ala Ala Thr Gly Gly Phe Pro Asn His Thr Lys Gly Gly Tyr Ser Cys
            355                 360                 365
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40

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Asn Asn Asp Met Gly Phe Leu Gly Ser Ala Gly His Asp Pro Leu Phe
    370                 375                 380

Tyr Ser His His Ser Asn Val Asp Arg Met Trp His Ile Trp Ser Thr
385                 390                 395                 400

Arg Leu Gly Gly Gly Gln Gly Ile Thr Glu Ala Asp Trp Leu Asp Thr
                405                 410                 415

Ser Phe Val Phe Tyr Asp Asp Val Lys Ser Pro Arg Lys Val Arg Ile
                420                 425                 430

Arg Phe Arg Asp Val Leu Asp Thr Arg Asp Leu Gly Tyr Thr Tyr Asp
            435                 440                 445

Ala Glu Ser Asp Lys Asp Leu Pro Trp Leu Arg Cys Lys Ile Ser Ser
    450                 455                 460

Leu Val Pro His Gly Lys Asp Ser Pro Pro Arg Ser Ser Ser Ala Arg
465                 470                 475                 480

Lys Ala Ala Pro Val Phe Pro Leu Ala Leu Thr Lys Gly Gln Val Val
                485                 490                 495

Glu Val Pro Ala Val Pro Val Pro Ala Lys Asp Pro Gly Lys Glu Gln
            500                 505                 510

Leu Leu Val Ile Glu Gly Ile Glu Tyr Asp Pro Gln Ala Asn Asn Lys
        515                 520                 525

Phe Asp Val Ala Ile Asn Leu Pro Ala Asp Lys Ala Leu Gln Val Gly
    530                 535                 540

Pro Gln Tyr Lys Glu Tyr Ala Gly Ser Phe Ala Val Val Pro Gly Ser
545                 550                 555                 560

Gly Ala Gly Lys Thr Arg Lys Val Lys Leu Ser Leu Cys Ile Thr Glu
                565                 570                 575

Val Leu Phe Asp Ile Asp Ala Asp Gly Asp Lys Thr Val Asp Val Val
            580                 585                 590

Ile Val Pro Arg Thr Asn Ala Lys Ile Thr Leu Asn Ala Arg Pro Thr
            595                 600                 605

Ile Lys Asn Arg Asn
    610

<210>  41
<211>  409
<212>  DNA
<213>  Zea mays

<220>
<221>  unsure
<222>  (409)
<223>  n = a, c, g or t

<400>  41
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ggcgactgct atcgccccga caccctctgc atgcccatcc acggttccca agaacaagaa 120
gaatgctgcc ggccggcggc ggcgcacatt gcagtgcagg gccagcggcc ggcggggcga 180
cgacgaagac agccgcctcc tctggctgcc ccggcgggaa gtgctgaccg gtctgggcgg 240
cgtggccgcc agcttcgtcg ggtacccgga tctggcttcc atcgccctgg aagcgaaccc 300
cgtggagagc tgccggcggg gcgagaaggt gacggagaag ctggtggagt gctcggaccc 360
gaacagagac ttcccgtgcc cgccggcgtc acgggtcccc atcgtggan              409
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<210> 42
<211> 123
<212> PRT
<213> Zea mays

<400> 42

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Met Ala Thr Ala Ser Ala Ala Ser Ser Phe Leu Val Pro Ala Thr Ala
  1               5                  10                  15

Ile Ala Pro Thr Pro Ser Ala Cys Pro Ser Thr Val Pro Lys Asn Lys
             20                  25                  30

Lys Asn Ala Ala Gly Arg Arg Arg Thr Leu Gln Cys Arg Ala Ser
         35                  40                  45

Gly Arg Arg Gly Asp Asp Glu Asp Ser Arg Leu Leu Trp Leu Pro Arg
     50                  55                  60

Arg Glu Val Leu Thr Gly Leu Gly Gly Val Ala Ala Ser Phe Val Gly
 65                  70                  75                  80

Tyr Pro Asp Leu Ala Ser Ile Ala Leu Glu Ala Asn Pro Val Glu Ser
             85                  90                  95

Cys Arg Arg Gly Glu Lys Val Thr Glu Lys Leu Val Glu Cys Ser Asp
             100                 105                 110

Pro Asn Arg Asp Phe Pro Cys Pro Pro Ala Ser
         115                 120
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<210> 43
<211> 497
<212> DNA
<213> Glycine max

<220>
<221> unsure
<222> (325)
<223> n = a, c, g or t

<220>
<221> unsure
<222> (397)
<223> n = a, c, g or t

<220>
<221> unsure
<222> (411)
<223> n = a, c, g or t

<220>
<221> unsure
<222> (422)

42

<223>   n = a, c, g or t

<220>
<221>   unsure
<222>   (438)
<223>   n = a, c, g or t

<220>
<221>   unsure
<222>   (441)
<223>   n = a, c, g or t

<220>
<221>   unsure
<222>   (453)
<223>   n = a, c, g or t

<220>
<221>   unsure
<222>   (463)
<223>   n = a, c, g or t

<220>
<221>   unsure
<222>   (467)
<223>   n = a, c, g or t

<220>
<221>   unsure
<222>   (477)
<223>   n = a, c, g or t

<220>
<221>   unsure
<222>   (487)
<223>   n = a, c, g or t

<220>
<221>   unsure
<222>   (489)
<223>   n = a, c, g or t

<400>   43
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ctcaacacca tgtaccggca actggtgtca agttcaaaga ctccaacgct cttcttcggt 120
agcccttacc gtgcaggaga agatagtgat cccggtggtg gcactgtgga gaacattcct 180
cacggtccgg tccatatatg gaccggtgat aacacacaac ctaactttga ggacatgggg 240
actctctatt ctgctgctag agaccctatt ttctattctc accacgctaa tgtggataga 300
atgtggtcca tatggaaaac tcttngagga aagagagtga catcaaagac cctgattgtt 360
ggaatctggg ttctttctac gatgagaaca agaatcntgt cgtgtgaggt naggattgtc 420
tngtactaga agcttgantg ntaccaaatg atntgtccgt ggnaaancta gccaaancgg 480
tttcgangng gtcaaga   497

<210>   44
<211>   112
<212>   PRT
<213>   Glycine max

<220>
<221>   UNSURE

43

<222> (109)
<223> Xaa = any amino acid

<400> 44
Asp Leu Asp Tyr Asn Gly Val Glu Asp Gln Ser Ser Thr Gln Glu Gln
 1   5   10   15

Ile Ser Thr Asn Leu Asn Thr Met Tyr Arg Gln Leu Val Ser Ser Ser
            20   25   30

Lys Thr Pro Thr Leu Phe Phe Gly Ser Pro Tyr Arg Ala Gly Glu Asp
        35   40   45

Ser Asp Pro Gly Gly Gly Thr Val Glu Asn Ile Pro His Gly Pro Val
    50   55   60

His Ile Trp Thr Gly Asp Asn Thr Gln Pro Asn Phe Glu Asp Met Gly
 65   70   75   80

Thr Leu Tyr Ser Ala Ala Arg Asp Pro Ile Phe Tyr Ser His His Ala
            85   90   95

Asn Val Asp Arg Met Trp Ser Ile Trp Lys Thr Leu Xaa Gly Lys Arg
            100   105   110

<210> 45
<211> 713
<212> DNA
<213> Glycine max

<220>
<221> unsure
<222> (579)
<223> n = a, c, g or t

<220>
<221> unsure
<222> (618)
<223> n = a, c, g or t

<400> 45
ggtccctcct gaacctgtct gcatccattc ccatttcttc ttccgtatgc atgttcccac 60
cgtctaaaaa acctagcaaa gcaacaaaac ggcgtcatgc ttgggaagta gcatgcaatg 120
gtaaccctag aaataggagg gacattctga tcggccttgg aggactctat ggtgctacaa 180
caagtctcac aagtaacaac actggttctg catttggtgc ttcattgtcg cctccagatc 240
caactaactg cgttcaaccg gacccagaaa aagacccttt ttgcccacca cccccttcaa 300
agactacgag ctccctccac acgatgacaa gacattaccc cttcgaatta gaccaagctg 360
ctcatttggt cactgatgat tacatagcca agtacgagga agccgtgagg cgcatgcaag 420
accttccacc tgatgatcct cgcagtttca tgcaacaagc caatgtccac cgtgcctact 480
gcgatggtcc cggctatatc aaaagggttc gctgactaca agcttgacgt tcacggtcct 540
ggatatcctt ccctgggacg ctggtactcc atttctaana aaaacctggg aagatgatcg 600
atgacccact tcgctctncg ttttggaacg ggacaatccc gccggatgag atcctcccat 660
ttcacaagac aaattcactc tctacgacga acacaagaat acgttaatgt taa   713

<210> 46
<211> 162
<212> PRT
<213> Glycine max

<400> 46

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Ser Leu Leu Asn Leu Ser Ala Ser Ile Pro Ile Ser Ser Ser Val Cys
  1               5                  10                  15

Met Phe Pro Pro Ser Lys Lys Pro Ser Lys Ala Thr Lys Arg Arg His
            20                  25                  30

Ala Trp Glu Val Ala Cys Asn Gly Asn Pro Arg Asn Arg Arg Asp Ile
        35                  40                  45

Leu Ile Gly Leu Gly Gly Leu Tyr Gly Ala Thr Thr Ser Leu Thr Ser
    50                  55                  60

Asn Asn Thr Gly Ser Ala Phe Gly Ala Ser Leu Ser Pro Pro Asp Pro
 65              70                  75                  80

Thr Asn Cys Val Gln Pro Asp Pro Glu Lys Asp Pro Phe Cys Pro Pro
            85                  90                  95

Pro Pro Ser Lys Thr Thr Ser Ser Leu His Thr Met Thr Arg His Tyr
            100             105             110

Pro Phe Glu Leu Asp Gln Ala Ala His Leu Val Thr Asp Asp Tyr Ile
        115             120             125

Ala Lys Tyr Glu Glu Ala Val Arg Arg Met Gln Asp Leu Pro Pro Asp
    130             135             140

Asp Pro Arg Ser Phe Met Gln Gln Ala Asn Val His Arg Ala Tyr Cys
145             150             155             160

Asp Gly
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